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(54) Title: DIGITAL DC-DC CONVERTER USING DIGITAL MODULATION

(57) Abstract: A digital DC-DC converter is implemented using first-order delta-sigma modulation, rather than A/D conversion . In the DC-DC converter, a PWM generator 210 converts an input DC voltage to a preset level DC voltage according to an input PWM signal. A converter 220 converts the DC voltage from the PWM generator 210 to a preset level voltage. A delta-sigma modulator 230 converts a feedback voltage Vfd corresponding to the output voltage Vout of the converter 220 to a 1-bit digital voltage Vo according to a preset reference voltage Vref. A counter 240 counts logic l's in 1-bit digital voltage signals Vo from the delta-sigma modulator 230. A delay controller 250 controls a high-level delay time according to the number of logic l's counted by the counter 240 and transfers a PWM signal having the controlled high-level delay time to the PWM generator 210.